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ABSTRACT

Research into the reading process has shaped an understanding of how readers "make meaning" when they are engaged in a reading activity. This research has highlighted a learning triad--the reader, the text, and the context (or learning environment)--that interactively affects the manner in which the student will comprehend a particular text. Research also permits reading teachers to consider such prereading characteristics as the role of background knowledge, reader/text interaction during reading, and the review, recall, and student response activities that occur after the text has been processed. Similarly, in examining instruction it seems particularly helpful to consider the variety of strategies that readers need to use at each of these three stages in the reading process. Instructional activities before reading might focus on the vocabulary and conceptual knowledge appropriate for a specific task. They could include prequestions, analogy, and the idiosyncratic associations students tend to make in an attempt to relate what they already know to what will be contained in the text. Activities during reading might focus on helping the reader develop self-questions or respond to inserted questions. Activities following reading might focus on post-questions, student response, and text- and script-based recall. The most important point to remember is that when instruction focuses on strategies--on how a student interpreted a certain idea and arrived at a certain response--then the student will be more likely to learn to cope effectively with a wide variety of reading tasks as an independent reader. (HOD)

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WHAT RESEARCH IN READING REVEALS ABOUT THE READING PROCESS

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WHAT RESEARCH IN READING REVEALS ABOUT THE READING PROCESS

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As reading specialists, many of us have been trained to focus on what students do; we look at test results, work sheets, and exercises in order to understand our students' reading achievement, the skills they have acquired, and the skills which still need to be learned. Reading research during the past fifteen years has been extremely important for those of us who want to help students learn to read better, and the most interesting and useful aspect of this research has been its focus on how rather than on what students do. Although "process" and "product" are far from new concepts, our expanded knowledge about the reading process is powerful and can make a difference in the goals of our lessons, in the way we interact with students as we help them learn, and in the manner in which we assess needs and evaluate growth.

For example, research into the reading process has shaped our understanding of how readers "make meaning" when they are engaged in a reading activity. This research has highlighted a learning triad: the reader, the text, and the context (or learning environment) as they interactively affect the manner in which a student will comprehend a particular text. In this chapter, three aspects of recent research will be described and then related to the learning triad. They are: 1) the construction of meaning, 2) the relevance of background knowledge, and 3) the use of metacomprehension or self-monitoring when reading. After reviewing aspects of this research which are particularly pertinent to the instructional setting, instructional activities useful for the secondary school will be described.

The Constructive Nature of Reading

Reading is interactive because it requires coordination between the reader's background knowledge and the reader's use of actual text (Rumelhart, 1977). When readers have a better command of strategies for deriving meaning or when the language and content of a text are familiar to them, the construction of meaning tends to be more idea- or concept-driven (Bobrow & Norman, 1975), and to rely less on cues from the text itself. However, when the language and content are difficult and processing of ideas breaks down, readers tend to pay more attention to details of the text and to concentrate on smaller units of language (Spiro, 1979).

Let's remember the many instances when we've seen our students "figure out" the words or "say the sentences right" without any idea of what it all meant; they'd started with the words and sentences but would have little sense of the more global meaning of the passage. This sometimes happens when text-based processing receives undue focus. While people may make meaning by focussing on words, sentences, and large units of text, sometimes they don't (and some people cannot). Also, this is frequently an inefficient way to process the text in that a focus on bits of meaning is slower, takes more space in memory, and may interfere with the reader's interpretation of what the author is saying. On the other hand, when the concept-driven process focusses too heavily on overall concepts, readers sometimes emerge with a very general idea of what a passage is about, but lack the specifics. Over-reliance on generalized concepts can lead to imprecise meaning with too many reader-made assumptions. It is important that we 1) be aware of possible overreliance on one strategy or the other, 2) focus our instruction on the flexible use of concept-based and text-based cueing systems, and 3) encourage our

students to make decisions about the kind of strategies which are most helpful in comprehending a particular text. Asking students such questions as "Did you get that from the text?", "Did you think of that yourself?", or "Is that helpful in understanding the text?" may help both student and teacher evaluate comprehension strategies for a particular portion of a particular text. It may also lead the students to experiment with other strategies as they confront new texts.

To understand the many variables which affect the comprehension process, we also need to look beyond text- or concept-driven strategies. The notion that the development of meaning is a constructive process draws upon the works of such diverse people as Anderson (1977), Bartlett (1932), Polyani (1966), Rumelhart (1977), and Spiro (1980). It includes the following as constraints on reading: 1) the reader's general knowledge, language patterns, and attitudes; 2) the language and content of the text; 3) the demands and goals of the specific reading task; and 4) the instructional environment and general climate for learning--as they all interact (Langer, 1980a). Together, these provide a broad view of what influences an individual student in processing and comprehending a particular text. Comprehension is not a simple text-based process in which readers piece together what the words, sentences, or paragraphs "say"--as if words themselves have some inherent meaning. Nor is it simply a concept-driven process in which readers begin with a global notion of what the text will be about, and anticipate the larger meanings the text will convey. Rather, comprehension is a process which requires <u>readers</u>--real live readers with ideas and attitudes of their own--to interpret what the author is saying in the text. From this point of view, the text is merely a blueprint using a linguistic code; readers must use the blueprint to stimulate

their own ideas and create their own meanings. This is not to suggest that readers go off into an idiosyncratic world of fanciful meaning, but that they and they alone have the power to create meaning--their meaning that is closer to or further from the meaning that the author intended, but reader-generated nonetheless. Once teachers accept this notion of meaning construction, it permits instruction to focus on why a certain interpretation was or was not made by a reader.

As a passage develops, ideas are introduced, refined, and integrated. Meaning can't be derived from a sentence or text segment alone, but must be considered as part of the reader's growing envisionment of what the entire passage is about. Therefore, meaning derived from a particular portion of the text will be shaped by how earlier segments were interpreted, and will continue to develop and change in the light of later segments. In addition, interpretations of passages will change based on the context or purpose for reading. This is but another bit of evidence that meaning is reader and situation specific.

The goal is an appropriate mix of reading strategies. There is not necessarily a better-worse or first-second sequence, but rather a breadth and flexibility which we must help our students develop. Poor readers tend to be those who become overly reliant on one strategy (Spiro, 1979). Readers must use the words and sentences in a text as well as their personal language, knowledge, and experience to create a changing and growing meaning. As a reader progresses through a text, the envisionment flexes and grows. There is no stasis. As the ideas develop, the reader must learn to rely on a varying and fluid range of strategies and cueing systems to elaborate the meanings further still.

What all this means to the secondary teacher is that we must be aware that as readers engage in each new reading task, they already have important knowledge that each of them can use or learn to use to get meaning. Students generally have a good hunch about the genre of the passage (newspaper article, worksheet with passage and fill-in questions, social studies text, biography), about the general topic, about the language and tone of the passage, and about the information they will need when they finish reading (for multiple-choice questions, class discussion, research paper). By being aware of these factors (all of which affect the manner in which the student processes the text), the teacher can assist the student to develop more efficient and more effective comprehension strategies. Discussions focussing on what students know about the topic and the genre, and hypotheses about how these might be dealt with in the text are often a rich way to develop expectations which are helpful for comprehending the text. It is also important to tell students why they are reading the text (quiz, report, literary discussion) and to think in advance about the kind of information they might focus on to best reach that goal.

The Influence of Background Knowledge

In this paper, background information will refer to quite explicit "facts" which are specifically related to the topic, while background knowledge is used in a more discursive sense to describe both specific "background information" and all other usefully related knowledge, however tangential it might be. Just about everyone agrees that in some critical way background information plays an important role in how a student comprehends a passage. Frequently this generalization has been intuitive; though teachers are often

sure there is a knowledge gap between the text and the reader (especially in subject area textbooks), they aren't quite sure exactly where the gap is or what to do about it. In recent years, there has been a good deal of research into the question of prior knowledge and how it affects comprehension. We now know empirically what teachers have often suspected: that cultural background, personal world knowledge, and first-hand experiences with related topics all affect the manner in which the reader organizes information in memory (Pichert & Anderson, 1977; Reynolds et al, 1981; Rumelhart & Ortony, 1977; Steffensen, Jogdeo & Anderson, 1978), what text-related information will be brought to mind in reading about a given topic (Anderson, Spiro & Anderson, 1980; Langer, 1980b; Langer & Nicolich, 1981; Spiro, 1979), what associations the reader will make based on personal experiences and background knowledge (Langer, 1981a,b, 1982), and what language (or vocabulary) the student will think of or use based on the perspective or point in reading (Anderson & Pichert, 1977; Anderson, Pichert & Shirey, 1979).

We also know that in order to comprehend a text, students need to relate the vocabulary and concepts in the text to some background knowledge they already have stored in memory (Rumelhart & Ortony, 1977; Anderson, 1977). If a reader has poorly organized or weakly developed understandings of a particular concept, comprehension becomes difficult (Pearson, Hansen & Gordon, 1979).

One aspect of this problem that teachers must seriously consider involves student/teacher communication (Langer, 1982). Does the teacher really know that a student lacks background knowledge about a specific topic, or has the student simply used language which the teacher didn't imagine was related to the topic? Did the student introduce information which the teacher felt to

be tangential because it didn't fit with the language and ideas the teacher expected to be expressed? We must consider not only the language and content which is presented in the text, but also differences between the language and background knowledge of teacher and student. Due to differing life experiences, people organize their knowledge in different ways, and these may differ from student to student as well as from the way in which a teacher may have organized these ideas. We must remember too that there is an "academic" language--a way of organizing and retrieving information and a way of discussing ideas which may simply not be in the realm of a student's experience. In such situations, the student may have a store of useful and related knowledge--if only the student could verbalize it and the teacher could understand how to use it as an aid to comprehension.

When students begin to read about a topic, or when there is a class discussion about a topic, language or ideas which seem fuzzy, irrelevant, or tangential to the teacher may be perfectly appropriate links with background knowledge for a particular student. Student knowledge and experiences differ and therefore what is stored in memory and the way it is stored will differ. These same diverse students may pull different bits of knowledge from memory in different ways, and may even use different language to relate their background knowledge to a particular learning experience. It is the teacher's role to help students make links between what they know and what they will read--and to evaluate that in terms of their understanding of the genre and the purpose for reading. Of course we hope to help all students communicate in some common manner with the author of the text, with the teacher, and with each other. Unfortunately, we can't always start there.

Though there are occasional times when students have inadequate knowledge

about a topic, most often they know something about just about every topic they will read about in school--some knowledge however tangential that may be. To help our students become aware of what they do know that is useful for comprehension, we might ask them why they thought of certain ideas and why they gave the responses they did--reserving right or wrong judgments until we hear the reasons. This activity will help us focus on the kind of thinking the student did and the kind of reasoning that took place when the response was made. Teacher and student can then discuss what could have been done differently, which bit of information may have been more appropriate than another, and why.

All this is directly relevant to reading in the secondary schools, where some 85% of the reading students do is expository or information-getting. Before textbooks are assigned for reading, teachers might first check to see what background knowledge their students have--student knowledge in student language. This knowledge can then be related to the vocabulary and concepts which are in the text--moving from what is known to the new. Although some students will undoubtedly need some direct instruction in new concepts, many others will be able to read and comprehend the text with greater success if they are simply given the opportunity to begin with the background knowledge they relate to the reading task, and then learn to judge for themselves how this might help them better understand the information in the text, to think about what else they know that might be helpful, and to use their own concepts to help them understand less familiar vocabulary. Starting with the student's language and background knowledge rather than that of the teacher or the text may make all the difference in the manner in which a text is processed and the degree to which it is understood.

Metacomprehension or Self-monitoring when Reading

An entire body of research suggests that more efficient readers are those who have some sort of control over their own reading strategies (Brown, 1982). This "self-reading" and control of strategies used when processing a text is called metacomprehension. Metacomprehension refers to a monitoring system which involves self-reflection and awareness of what we know or need to know in a particular reading situation, and what needs to be done if things go wrong (Brown, 1982). Metacomprehension can be thought of as having two separate components: awareness and action. "Awareness" is the self-reflection people do when "watching" their own cognitive behavior as they read. This includes: 1) awareness of the goal of the reading assignment, 2) awareness of what is known about the topic and the reading task, 3) awareness of what needs to be known, and 4) awareness of the strategies which facilitate or impede the gaining of meaning from reading. "Action" is the self-regulatory activity people engage in as a response to their self-monitoring. When things go wrong, regulatory mechanisms help readers 1) to relate the reading problem to similar problems, 2) to engage in strategy changes, 3) to check to see if their problem-solving attempts have been successful, and 4) to anticipate what to do next.

Metacomprehension activities serve as a "third eye" which permits a reader to check that ideas in the text make sense and are consistent with one another (Baker & Brown, 1980). Because there are varying levels of "how much you need to understand," readers must make this judgment based on the purpose for reading. Poor readers are less aware than good readers of the strategies they use during reading (so too for young as compared with older readers), and are also less aware when things go wrong. Similarly, young

readers do not seem to notice inconsistencies even when they are capable of doing so (Markman, 1979). Therefore young or poor readers are less likely to seek clarification of poorly understood material. What this means to the classroom teacher is that we can't expect students to "read more carefully," "figure things out for themselves," "look it up," or "ask someone for help" when in so many cases the student is unaware that something has "gone wrong" in the first place.

Results from research on metacomprehension can help teachers focus on the fundamental processes their students do or do not use when they do or do not comprehend a text. In classroom environments, the teacher rather than the students usually makes the decisions about what the students are to do and what they need to know. Learning to choose what strategies to use is excluded from instructional activities because appropriate teaching procedures may have been too vaguely defined. However, some instructional strategies have recently been suggested which can easily be incorporated into instructional progams. Brown, Campione & Day (1980) have developed a technique for helping students reflect on their own comprehension through internalizing and monitoring certain rules for summarizing passages. Their rules are: 1) delete trivial material, 2) delete redundant material, 3) substitute a superordinate term for a list of items, 4) substitute a superordinate event for a list of actions, 5) select a topic sentence, if any, and 6) if there is no topic sentence, make it up. It is not merely the presentation of rules which makes this activity different from most summarizing activities, but the fact that the rules require decision-making and judgment on the part of the students. Also, the students are encouraged to understand the significance of their decisions and to anticipate the outcome of their actions. Students

and teacher work closely together to help the students gain the strategies needed for this task, and the self-reflection necessary to become more efficient learners in general.

Similarly, Anderson (1978) has developed self-questioning techniques to improve students' comprehension and retention. Students are encouraged to generate questions before reading (for anticipation), during reading (for focus), or after reading (for studying and remembering), based on items in the text being read. Teachers might use such student-generated questions as an interim activity to facilitate comprehension or recall, or as an evaluative index of what the student learned from the text. Some of the activities Anderson suggests are: 1) when reading silently, students can generate questions about material to be learned, 2) students can initially study the text material without generating questions, and then question one another in "study pairs", or 3) for test preparation, students can develop a master list of questions which can be evaluated by the group and used by class members as a study aid.

Baker & Brown (1980) make the distinction between metacomprehension (keeping track of comprehending) and reading for remembering or studying. The latter involves identification of important ideas, testing one's own mastery of the material, allocating study time effectively, and developing effective study strategies. The more explicit that teachers are in helping students understand and use the rules (as well as monitor the effectiveness of their use), the more successful instruction will be.

Two general kinds of problems that impede successful comprehension are 1) inefficient or inappropriate application of rules and strategies and 2) lack of background knowledge. This section has stressed the kinds of

strategic instruction which will help students become aware of useful strategies for studying and remembering. What can be important and different about the suggested activities is that they can help students not only learn the specific rules or skills, but also learn self-management, self-regulation and self-monitoring in other learning activities.

Factors that Influence Reading: The Reader, the Text and the Context

From the discussion above we can see that reading research has a great deal to say to teachers about the reading process. Current thinking suggests a number of variables which affect the reader during every moment of the reading experience. These include factors inherent in the reader such as personal experiences, language, and content knowledge (Langer, 1980a), and factors inherent in the text such as concepts, vocabulary, and organizational structure (Tierney & Mosenthal, 1982), the linguistic nature of the text itself such as sentence structure and cohesive ties (Halliday & Hasan, 1975), and genre, point of view, and style. Since these interact during each reading experience, we must continually consider the aspects of each specific "reader-text interaction"--those factors in the reader or the text which make it difficult for the reader to gain meaning from that particular reading experience.

In addition to the reader and the text, we must also consider the context for reading--the context in its largest sense, from the classroom environment and the student-teacher and student-student relationships, to the environment for learning in the school, to the context for literacy in the home and within the community-at-large. We can consider the following "affectors" as they influence text comprehension (for further discussion, see Langer, 1980a):

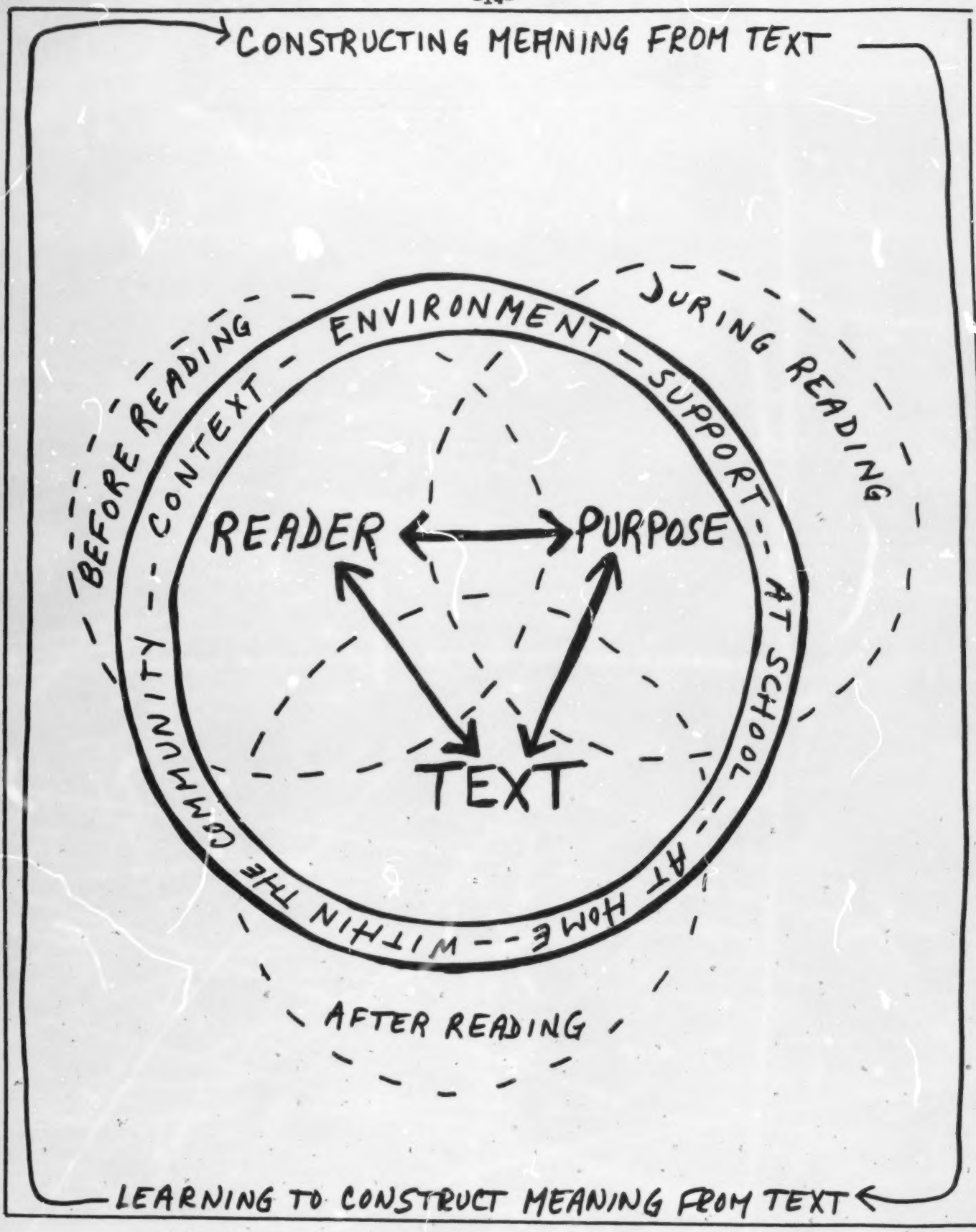
READER	TEXT	CONTEXT
self image	content	student-text
values	vocabulary	student-teacher
attitudes	organization	student-student
background experience	sentence structure	classroom
content knowledge	cohesion	school
language	coherence	home
interests	genre	community
understanding of the task	point of view	society
physical and emotional state	author's purpose	

Multiple Constraints on the Reading Process

This section will examine some of the variables which contribute to the complexity of the reading process (see Figure 1).

Insert Figure 1 about here

At the center of each specific reading experience is the reader and text interaction which is always affected in some real way by the purpose for the reading activity (Figure 1). This purpose for reading directly affects the extent to which a reader relies on the printed page or goes beyond it to relevant background knowledge and experiences. Although a reader may have efficient text-driven as well as concept-driven strategies, the reading strategies which are actually used will be influenced by the individual's purpose for reading in that specific instance. The reading of a leisure time story differs in obvious ways from the reading of a novel for an English essay which in turn differs from a series



MULTIPLE CONSTRAINTS ON THE READING PROCESS

Figure 1

of reference books which will be read for a term paper, and these will differ when either reference books or novels are being read for a multiple choice test. Comprehension strategies differ somewhat from one reading situation to the other, and when reading becomes difficult or things go wrong, the most appropriate fix-up strategies will also differ. Different purposes for reading will permit smaller or larger gaps to exist between reader and author. For example, a poorly organized text may not be a problem if the purpose for reading is to get a very general idea about the climate in Mexico City before making a trip there. At other times it is necessary for the reader to be aware of specific personal biases--and to keep them aside--so that the view of the author can be interpreted as openly as possible. Students must learn to become aware of the strategies they use when reading for different purposes, and teachers must be aware that what the reader gets out of the text is a function of the purpose as well as of the text itself.

These are merely a few of the ways in which the reader, the text, and the purpose for reading intersect and shape the manner in which the reader will process the text. Continually impinging on this core is the larger context for reading. Surely there are subtle verbal and non-verbal "success" and "non-success" messages from author to reader, between the teacher and student, and within the classroom environment (Gumperz, 1980; McDermott, 1978), and all affect the student's sense of self-as-learner, as a reader, and as a participating (or non-participating) member in the academic world of ideas. Studies by Allington (1980) and Gumperz (1979) have indicated that poorer readers tend to invoke teacher questions which focus on word recognition and word meaning while more successful readers are asked questions about the "message" of the text. Allington also found that poorer readers

tend to be assigned fewer silent reading activities than their more "successful" classmates. The attitudes underlying such behavior are frequently communicated in subtle ways and can contribute to the growing chasm some students feel between their home and school selves.

Conclusions

Although reading is in many ways a recursive activity in which the mind races ahead to anticipate what will come next and skips backward to review and revise interpretations that have already been made, it is helpful for purposes of analysis to focus on three stages of reading: before the text is read, while the text is being read, and after the eyes have left the page (Robinson, 1978). In examining the research, this permits us to consider such prereading characteristics as the role of background knowledge, reader/text interaction during reading, and the review, recall, and student response activities which occur after the text has been processed (Tierney & Cunningham, 1980). Similarly, in examining instruction it seems particularly helpful to consider the variety of strategies which readers need to use at each of these three stages in the reading process. Instructional activities before reading might focus on the vocabulary and conceptual knowledge appropriate for a specific task. They would surely also include prequestions (Anderson, 1978), analogy (Hayes & Tierney, 1980; Rumelhart & Ortony, 1977), and the idiosyncratic associations students tend to make in an attempt to relate what they already know to what will be contained in the text (Langer, 1978, 1982). During-reading activities might focus on helping the reader develop self-questions or respond to inserted questions (Andre & Anderson, 1978). Anticipation of large structural, organizational, or rhetorical

elements might also be developed. Interventions after reading might focus on post-questions (Anderson & Biddle, 1975), student response (Gagné, 1978), and textually and scriptally-based recall (Pearson & Johnson, 1978).

We have segmented the forces which constrain reading comprehension in order to gain a clearer view of the nature of the constraints. However, comprehension, in reality, is multidimensional and the multiple constraints described above must be considered simultaneously and perceived in their naturally interwoven textures if they are to be useful for instructional purposes.

The most important point to remember is that when instruction focuses on strategies--on how a student interpreted a certain idea or arrived at a certain response--then students will be more likely to learn to cope effectively with a wide variety of reading tasks, on their own, as independent readers. The chart below suggests some of the strategies teachers might consider when they are planning such instructional activities. The list is by no means complete, and is meant to serve as the beginning of a guide which teachers can develop further in their daily work.

Although the division of strategies into before, during, and after the reading experience has been provided for purposes of clarity, most of the strategies are used throughout the reading process and can therefore be used for instructional purposes in a vareity of combinations other than those proposed here.

Before	During	After
content related background knowledge (concepts)	predicting what comes next	organization of recall (hierarchical)
text-related knowledge (format, text structure)	integrating (constructive aspects)	organization of text (recall of structure as well as recall of details)
specific vocabulary knowledge	using self-questions	post-questions (textually-and-scriptally-based)
understanding the purpose for reading	knowing when additional information is needed and how to get it	long and short term recall of understanding of task
familiarity with style, genre	keeping purpose for reading in mind	knowing when being uncertain is okay
knowing what one knows and needs to know	monitoring inconsistencies	judging if information gained is sufficient (based on purpose)

If instruction is to offer the most meaningful learning experiences for each student, then teachers must focus on activities which go well beyond the drill and practice work which abounds in so many classes. We must also re-think the "reading lab" organizational plan of the sixties and seventies which stressed "hierarchical skills" and "individual contracts" to the point that the vital dialogue between teacher and student and between fellow students was lost. The activities described in this paper just don't fit into the traditional secondary "lab" environment. Surely the laboratory organizational plan is efficient in getting each student to work alone and to practice subskills based on individual needs. But such an approach may not come close to tapping the real and basic learning needs which are at the core of every reading (and writing) experience: learning to interact in a meaningful manner with the material in the text, and learning what to do and what not to do when attempting to get at meaning through reading.

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